

# Indiana State of the Environment Report

## Chemicals



*Photo courtesy of Science Works, Children's Museum of Indianapolis*

Chemicals in Indiana are used in life-saving drugs, manufacturing processes and consumer products. While children can learn about chemistry at the Children's Museum of Indianapolis, Hoosiers should be free from worry about unsafe chemicals, whether they are breathing Indiana's air, paddling a canoe down Sugar Creek or playing football on the lawn.

# Chemicals

## Chemicals in Indiana's environment

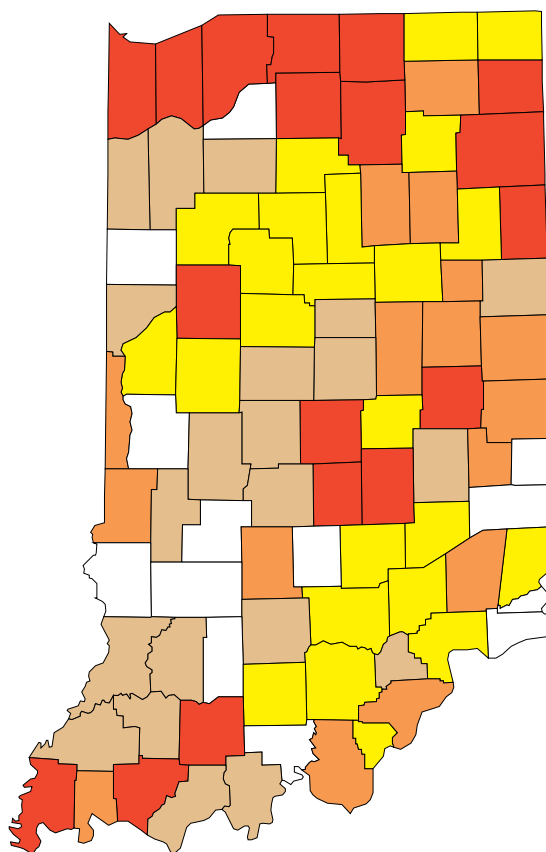
Just as air pollution blows freely across county lines and water pollution flows downstream, many chemicals affect multiple segments of our environment. Many of these pollutants are toxic chemicals that persist in the environment and can cause long-term health effects or pose serious environmental concerns.

The U.S. Environmental Protection Agency (EPA) and IDEM collect information on toxic chemicals managed by manufacturers through the Toxic Release Inventory (TRI). Facilities must file a TRI report if they have 10 or more employees, are included in Standard Industrial Classification codes 20-39 and use, manufacture or process any listed toxic chemical in quantities greater than the established thresholds for a calendar year.

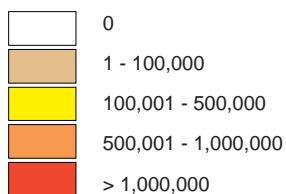
The TRI reports include information on the manufacturer's release of the listed toxic chemicals to the environment, the management of wastes containing these chemicals and annual changes in the production of products associated with these toxic chemicals.

TRI reports for 1997 were submitted by 1,000 Indiana facilities for 181 toxic chemicals. In 1995, 1,008 facilities submitted reports for 161 listed toxic chemicals.

### Toxic chemical releases from manufacturers



Pounds of reported releases



Source: Taylor University (map), 1999; Toxic Release Inventory database, 1997

For more details  
visit chemicals @

[www.state.in.us/idem/soei99report/chem](http://www.state.in.us/idem/soei99report/chem)

## Releases to the environment

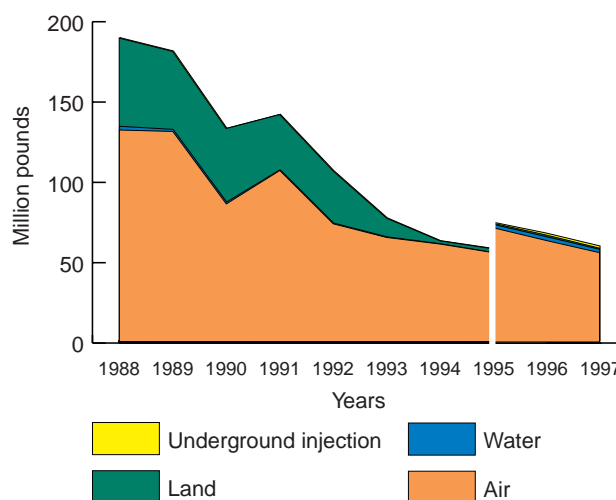
Indiana manufacturers reduced their reported releases of toxic chemicals from 190 million pounds in 1988 to 59 million pounds in 1997. This 69 percent reduction is based on chemicals that were subject to reporting for each of the ten years.

In 1995, EPA added nearly 300 new chemicals to the list of reportable toxic chemicals. Even with this expanded list of toxic chemicals, Indiana manufacturers have reduced reported releases 20 percent in two years. These reductions were accomplished while manufacturing activity increased 4 percent from 1995 to 1996 and 11 percent from 1996 to 1997.

Releases to air dropped 22 percent between 1995 and 1997. Five chemicals—toluene, ammonia, xylene, methylene chloride and styrene—contributed almost 50 percent of the air releases in 1997.

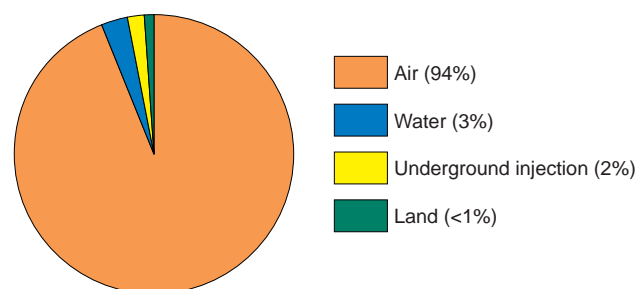
Lake and Elkhart counties had the most releases among Indiana's 92 counties. These two counties contributed more than 20 percent of the total toxic chemical releases.

### Trends in toxic chemical releases\*



\* In 1995, EPA added 300 new chemicals to the Toxic Release Inventory. Of these, 20 compounds were not reported in Indiana but were included in the 1998 *State of the Environment Report* for consistency with previous years. The break in the chart indicates this change in reporting.

### Types of toxic chemical releases



Source: IDEM's Toxic Release Inventory database, 1997

## Known and potential carcinogens

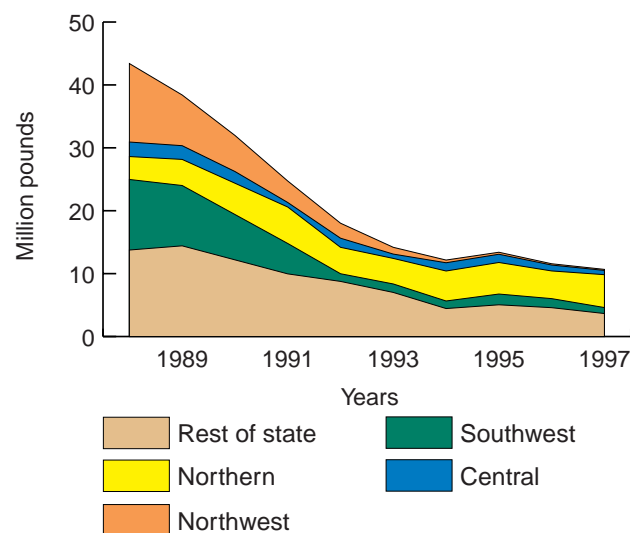
The TRI Program relies on the Occupational Safety and Health Administration's (OSHA) definition of "carcinogen" to identify chemicals that warrant special attention due to their potential to cause cancer in humans. The OSHA definition includes chemicals determined to be known, probable or possible carcinogens.

From 1988 to 1997, reported carcinogen releases decreased 75 percent, with a 20 percent reduction occurring between 1995 and 1997. Styrene and methylene chloride constituted more than 75 percent of carcinogen releases in 1997.

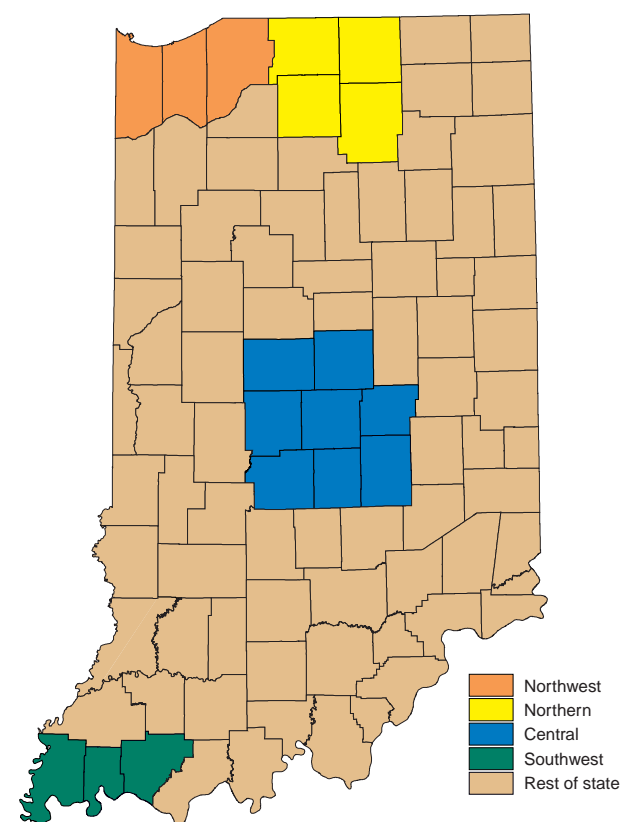
Indiana has designated four regions with large urban populations and significant manufacturing activity as priority regions. These four regions account for 66 percent of the total reported releases of carcinogenic chemicals in 1997, with Elkhart County contributing almost 35 percent of total reported releases.

The northwest, central and southwest regions reduced their reported carcinogen releases by approximately 45 percent between 1995 and 1997. The northern region had a 4 percent increase in releases over the two year period and an 18 percent increase in releases from 1996 to 1997. A more accurate method of reporting releases of styrene is responsible for a majority of this 18 percent increase.

### Trends in known and potential carcinogen releases



### Priority urban areas for carcinogens



Source: IDEM's Toxic Release Inventory database, 1997

## Environmental waste

Often, toxic chemicals are contained in environmental wastes that are disposed in permitted landfills, recycled, burned for energy recovery or destroyed through treatment. These activities may occur at the manufacturing site or at a waste management facility.

Between 1992 and 1995, Indiana saw an increase in toxic chemicals in environmental waste of 1.2 percent. From 1995 to 1996, the increase was 15 percent, due to increases in production. From 1996 to 1997, the total decreased 3.3 percent while production increased 11 percent.

## Pollution Prevention Progress

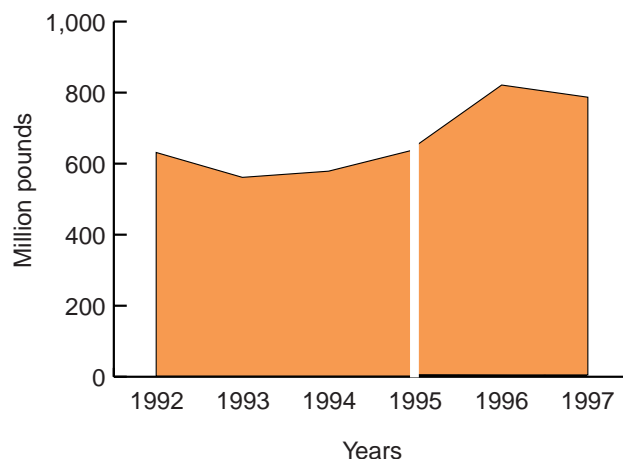
Pollution prevention, or source reduction, is a preferred method of environmental protection in Indiana. It includes practices that reduce or eliminate the creation of pollutants by increased efficiency in the use of resources and the conservation of natural resources. Pollution prevention is not recycling, energy recovery, treatment or disposal.

Indiana measures pollution prevention progress for manufacturers using the TRI Program. It compares the annual change in toxic chemicals in environmental waste with the annual change in production. The percent change in production minus the percent change in waste is the net pollution prevention progress.<sup>†</sup>

From 1992 to 1997, Indiana has made a net gain of 24 percentage points in pollution prevention. From 1996 to 1997, the gain was 14 percentage points.

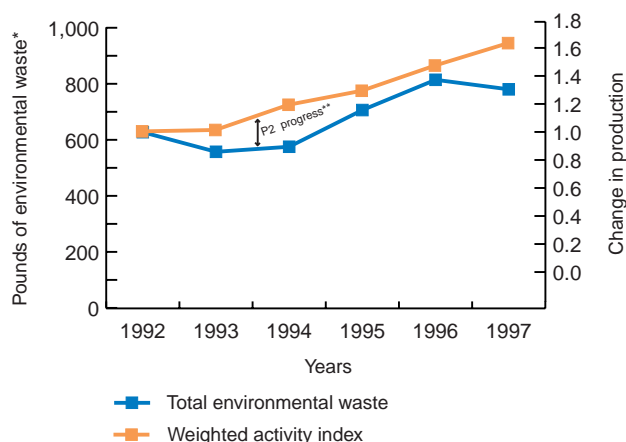
<sup>†</sup> Change in production reflects the change in production of those products directly associated with the amount of toxic chemicals in environmental waste.

## Trends in toxic chemicals in environmental waste generation\*



\* In 1995, EPA added 300 new chemicals to the Toxic Release Inventory. Of these, 20 compounds were not reported in Indiana but were included in the *1998 State of the Environment Report* for consistency with previous years. The break in the chart indicates this change in reporting.

## Pollution prevention (P2) progress



\* The increases from 1994 to 1995 were adjusted for additional chemicals.

\*\* Gap is proportional to pollution prevention progress.

Source: IDEM's Toxic Release Inventory database, 1997



## Toxics of special concern

### Lead

Lead is a naturally occurring metal used in piping, building materials, solder, paint and ammunition. Lead paint in homes is believed to be the major source of lead poisoning. Elevated blood lead levels (EBLs) typically are found in low-income areas and areas with older homes. In recent years, lead-acid storage batteries, metal products, chemicals and pigments have contained the most lead.

Since EPA banned lead in gasoline, paint, pipes, solder, food cans and other products, blood lead levels have dropped dramatically throughout the United States. Blood lead levels for individuals in the United States fell 78 percent from the 1976-1980 average of 12.9 micrograms per deciliter (ug/dL) to 2.9 ug/dL in 1991-1998. For the same time periods, the percent of U.S. children with blood lead levels at or above 10 ug/dL fell from 84.0 percent to 8.9 percent.

Excessive exposure to lead can elevate blood levels of the toxin in adults and children and can slow and permanently damage the mental and physical development of children age 6 and under.

The percentage of Indiana children with higher than normal lead levels is greater than the Centers for Disease Control and Prevention's national average of 4.4 percent. From 1995 to 1998, 99,000 Indiana children were screened for lead. Ten percent of these children were determined to have elevated levels of lead in their blood.

### Elevated blood lead levels test results, 1995-1998



Data is collected in counties where significant numbers of children with elevated blood lead levels were found prior to 1997.

Source: Indiana State Department of Health, Childhood Lead Poisoning Prevention Program, 1998

EBLs may result in learning disabilities, behavioral problems, mental retardation and seizures. The severity of these results depends on the degree and duration of the EBL.

**10 ug/dL or greater** is considered “elevated” and is associated with harmful effects on children’s behavior.

**15-17 ug/dL for 3 months or 20 ug/dL or greater** requires a physician’s treatment.

**70 ug/dL or greater** causes devastating health consequences, including seizures, coma and death.

Source: Centers for Disease Control and Prevention, and National Center for Environmental Health, 1997

## Mercury and PCBs

Two toxic chemicals, mercury and polychlorinated biphenyls (PCBs), are the major contaminants found in Indiana fish. Mercury is a naturally occurring metal which does not break down, but recycles between land, water and air. It is also released by coal-burning power plants and the burning of household, medical and industrial waste. PCBs are synthetic oils that break down very slowly in the environment and were once widely used in electrical transformers and capacitors. Health problems resulting from contaminants, such as mercury and PCBs found in fish, range from nearly undetectable changes to birth defects and cancer, with children being the most susceptible. Mercury may damage the central nervous system, while PCBs may damage the liver, kidneys and central nervous system and are probable human carcinogens.

Mercury and PCBs collect in the soil, water, sediment and microscopic animals. They build up in fish, especially in those fish that eat other fish. Each year, the *Indiana Fish Consumption Advisory* is issued by the Indiana State Department of Health through cooperative efforts with IDEM and the Indiana Department of Natural Resources. The advisory serves as a guide for fish consumption, categorizing Indiana waterways in five groups ranging from “unrestricted consumption” (group 1) to “do not eat” (group 5). The map to the right shows the waterways with the greatest mercury and PCB threats.

In 1998, approximately 1,500 miles of Indiana’s 37,000 miles of rivers and streams were categorized as “do not eat.” For nearly 200 of these miles, the categorization pertained to all species, while almost 1,300 miles were for at least one species other than carp. Initial analysis of fish tissue collected from long-term monitoring sites located throughout the state has shown a general decline in PCBs; however, levels of mercury appear unchanged over time.

### Most serious mercury and PCB levels in fish



In all Indiana rivers and streams, carp are contaminated with both PCBs and mercury. Do not eat carp that are over 25 inches in length. Pregnant women, women planning to have kids, and kids under age 15 should not eat carp over 15 inches.

Source: Indiana Fish Consumption Advisory, 1997 & 1998





# For More Information

## Indiana Department of Environmental Management

[www.state.in.us/idem](http://www.state.in.us/idem)

### Indianapolis Offices

(800) 451-6027 or (317) 232-8603

Hearing and speech impaired call:

(800) 743-3333 or (317) 232-6565

#### Mailing address:

P.O. Box 6015

Indianapolis, IN 46206-6015

#### Three Indianapolis locations:

- Indiana Government Center North, downtown
- Indiana State Teachers Association building, downtown
- Western Select Properties, Shadeland Ave.

### Northwest Regional Office

(888) 209-8892 or (219) 881-6712

#### Mailing address:

NBD Bank Building

504 N. Broadway, Ste. 418

Gary, IN 46402-1942

### Northern Regional Office

(800) 753-5519 or (219) 245-4870

#### Mailing address:

220 W. Colfax Ave., Ste. 200

South Bend, IN 46601-1634

### Southwest Regional Office

(888) 672-8323 or (812) 436-2570

#### Mailing address:

208 N.W. 4<sup>th</sup> St., Ste. 201

Evansville, IN 47708-1353

## Indiana Environmental Circuit Rider

[www.citiesandtowns.org](http://www.citiesandtowns.org)

(317) 237-6200

#### Mailing address:

150 W. Market St., Ste. 728

Indianapolis, IN 46204

## Indiana Department of Natural Resources

[www.state.in.us/dnr](http://www.state.in.us/dnr)

(317) 232-4020

#### Mailing address:

402 W. Washington St.

Indiana Government Center South, Ste. W256

Indianapolis, IN 46204

## Indiana State Department of Health

[www.state.in.us/doh](http://www.state.in.us/doh)

(317) 233-1325

#### Mailing address:

Environmental Epidemiology Section

2 N. Meridian St.

Indianapolis, IN 46204

## U.S. Environmental Protection Agency

Region 5

[www.epa.gov/region5](http://www.epa.gov/region5)

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